MICRONICS

M54Pi SYSTEM BOARD

MANUAL

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MANUAL

Document Number: 06-00208-01, Ver. A
Part Number: 09-00208-XX

June 1994

232 E. Warren Ave., Fremont, CA 94539-7085

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CHAPTER 1: INTRODUCTION

Micronics' M54Pi system board is a high-performance system board designed to be the basis for your personal computer or workstation. The M54Pi is based on the PCI local bus and the PCI chip set.

Intel's **PCI chip set** allows for improved integration and higher performance for the CPU. The chip set includes the CDC chip, DPU chip, and the SIO chip. See chapter 2 for more information on the PCI chip set.

The M54Pi is also Intel OverDrive™ ready, which makes it ready to accommodate the next generation of **Pentium** upgradeable chip. The boards also comes complete and ready to be installed. The system board is designed so that it can be installed with minimal or no help.

MEMORY

The M54Pi system board has three banks of DRAM (six sockets), which provides 192MB maximum memory using on-board SIMMs. The SIMMs include 256K x 36 (1MB) through 8M x 36 (32MB).

The M54Pi also has 256K of write-back cache installed on-board. There is an optional 512K secondary level cache available.

FEATURES

- Baby AT footprint form factor (13.25" X 8.5").
- Four ISA slots, two PCI local bus slots, and one ISA/PCI slot.
- On-board Super I/O controller (SMC 665).
- Intels' 82430 PCI chip set.
- On-board peripherals including two serial ports, one parallel port, one floppy connector, and two IDE interfaces (one ISA and one PCI).
- Phoenix 4.03 Flash EPROM BIOS.

SOFTWARE COMPATIBILITY

The M54Pi system boards are tested thoroughly under a variety of software packages. A sampling of programs include products by Microsoft, Novell, IBM, and Santa Cruz Operations.

CHAPTER 2: PCI CHIP SET

The M54Pi system implements Intel's PCI (*Peripheral Component Interconnect*) chip set. The chip set allows for better integration and higher performance for the CPU.

The Intel PCI chip set consist of four chips:

- 82434NX PCI/Cache/Memory Controller (PCMC).
- Two 82433NX Local Bus Accelerators (LBX).
- 82378ZB System I/O (SIO).

Each component performs separate tasks, but work dependently together. The components work as memory, provide second level cache control, and operate as a bridge between the Host bus and the PCI bus. Refer to page 2-3 for a simplified diagram of the PCI chip set.

PCMC CHIP

The PCMC functions include a cache controller, main memory controller, and a Host/PCI bridge. The chip's cache controller supports both write-through and write-back cache. The PCMC is also ideal for the 64-Bit Pentium processor at 60MHz or 66MHz.

The PCMC has a dual-ported architecture, this permits concurrent operations on the PCI bus and the host bus. The dual-port main memory controller interfaces the DRAM with the host bus and the PCI bus.

The PCMC works in tandem with the LBX chips. Together, they work as a full-function, dual-port data path that connects the main memory and forms a PCI bridge to the host subsystem. The component also controls data flow through the LBX.

LBX CHIPS

There are two 82433NX chips located on the M54Pi system board. Each chip provides a 32-bit data path connection between the host CPU and the main memory, plus a 32-bit data path between the CPU and the PCI Bus. The components also integrates three write-posting buffers and two read prefetch buffers. These buffers increase PCI Master and Pentium processor performance.

The LBX also has a dual-ported architecture, which permits concurrent operations between the host bus and the PCI bus. The components provide the address paths and bus controls during bus operations for the host bus, main memory and PCI bus.

DIAGRAM OF THE PCI CHIP SET

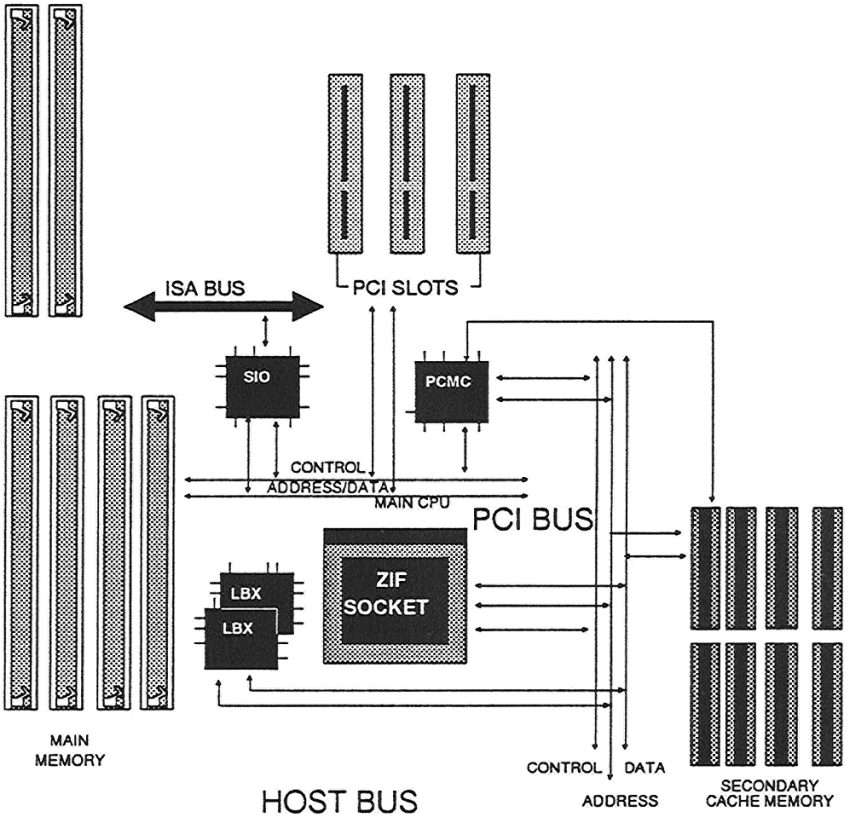


Figure 2-1. Simplified Diagram of the PCI Chip Set

SIO CHIP

The 82378ZB System I/O (SIO) chip acts as a bridge between the PCI bus and the ISA bus. This multi-faceted component incorporates several functions, including:

- Logic for a PCI interface (master and slave).
- ISA interface (master and slave).
- Enhanced seven channel DMA controller.
- Data buffers to isolate the PCI bus from the ISA bus.
- PCI and ISA arbitration.
- 14 level interrupt controller
- Three programmable timer/counter.
- An integrated BIOS timer.
- And a non-maskable-interrupt (NMI) control logic.

CHAPTER 3: SETTING UP THE M54Pi

After unpacking the M54Pi system board, place it on its anti-static bag. Carefully inspect the system for damage that might have occurred during shipment.

STATIC ELECTRICITY

It is important that you and the area where you will be working is static free. You should first ground yourself and then ground the board. Use a wrist or ankle strap to ground yourself.

OFFICE ENVIRONMENT

When installing the M54Pi, make sure the finished product is in an area with good ventilation. The system should also be away from direct sunlight or heaters. Always avoid any type of moisture, dust, or dirt.

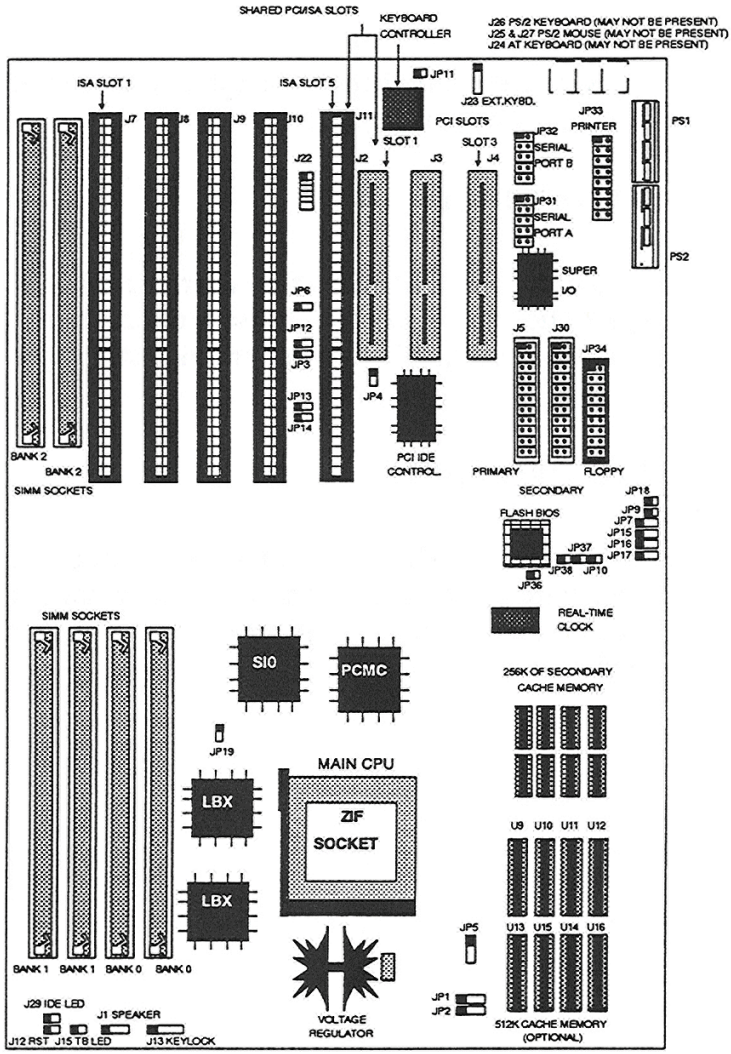


Figure 3-1. M54Pi System Board

SETTING THE JUMPERS

Refer to the following tables to set the jumpers.

Table 3-1. CPU Selection

JUMPER	CONFIGURATION	SETTING
JP1	90MHz 75MHz CPU	Pins 1-2 Pins 2-3
JP36	75MHz CPU/90MHz	Installed
JP37	75MHz CPU 90MHz CPU	Installed Not Installed
JP38	75MHz CPU 90MHz CPU	Not Installed Installed

Table 3-2. Flash ROM Mode

JUMPER	CONFIGURATION	SETTING
JP7	Normal BIOS Mode BIOS Recovery Mode	Pins 1-2 Pins 2-3
JP9	Read Only To Perform Flash BIOS Update	Not Installed Installed

Table 3-3. Real-Time Clock Selection

JUMPER	CONFIGURATION	SETTING
JP10	Clear the Real-Time Clock	Installed

Table 3-4. Cache Configuration

JUMPER	CONFIGURATION	SETTING
JP5	256K 512K	Pins 2-3 Pins 1-2
JP19	256K 512K	Pins 1-2 Pins 2-3

Table 3-5. PCI IDE Chip Selection

JUMPER	CONFIGURATION	SETTING
JP4	PCI IDE Chip Enabled (Default) PCI IDE Chip Disabled	Not Installed Installed

Table 3-6. Keyboard SMI Selection

JUMPER	CONFIGURATION	SETTING
JP6	Keyboard SMI: SIO-SMI Keyboard SMI: IRQ10	Pins 1-2 Pins 2-3

Table 3-7. Monitor Selection

JUMPER	CONFIGURATION	SETTING
JP11	Mono Color	Not Installed Installed

Table 3-8. IRQ for PCI IDE Selection

JUMPER	CONFIGURATION	SETTING
JP3	Primary IDE IRQ Selects IRQ 14 (Default) Primary IDE IRQ Selects IRQ 15	Pins 1-2 Pins 2-3
JP12	Secondary IDE IRQ Selects IRQ 14 Secondary IDE IRQ Selects IRQ 15 (Default)	Pins 1-2 Pins 2-3
JP17	Parallel Port Selects IRQ 7 Parallel Port Selects IRQ 5	Pins 1-2 Pins 2-3

Table 3-9. DMA Channel Selection

JUMPER	CONFIGURATION	SETTING
JP13	DMA Channel 6 DMA Channel 7	Pins 1-2 Pins 2-3
JP14	DMA Channel 6 DMA Channel 7	Pins 1-2 Pins 2-3
JP15	DMA Channel 1 DMA Channl 3	Pins 1-2 Pins 2-3
JP16	DMA Channel 1 DMA Channel 3	Pins 1-2 Pins 2-3

Table 3-10. Super-I/O Chip Configuration

JUMPER	CONFIGURATION	SETTING
JP18	Enable SMC665 (Default) Disable SMC665	Not Installed Installed

Table 3-11. The Peripheral and Case Connections

JUMPER	CONFIGURATION	FUNCTION\PIN OUTS
JP2	Reserved	Not Installed
J25 & J27	PS/2 Mouse Connector (may not be present)	
J23	External PC/AT Keyboard Connector (may not be present)	
J26	PS/2 Keyboard Connector (may not be present)	
J24	PC/AT Keyboard Connector (may not be present)	
JP31	Serial Port A	Can be Disabled at the CMOS configuration screen.
JP32	Serial Port B	Can be Disabled at the CMOS configuration screen.
JP33	Parallel Port	
J5	PCI IDE Connector (primary)	
JP34	Floppy Connector	
J29	On-Board IDE LED	
J12	Reset Switch	1-Signal; 2-Ground
J1	Speaker Connector	1-Power LED; 2-N/C 3-Ground; 4-(+) 5V DC
J13	Power LED/Keylock	1-Power LED; 2-N/C 3-Ground; 4-KeyBd LCK; & 5-Ground
J15	Turbo LED	
J30	ISA IDE Connector (secondary)	

CHAPTER 4: INSTALLING ADD-ON PERIPHERALS AND SYSTEM MEMORY

The M54Pi accommodates ISA and PCI local bus cards. Extra DRAM and secondary cache memory can also be added to the system board. The following chapter describes how to install the PCI card, SIMMs (memory), and SRAM memory.

WARNING

Before adding (or removing) any peripherals, make sure there is a clear space to work on and that you adhere to all anti-static precautions. Micronics recommends only trained technicians work on the motherboard. Damage that occurs to the motherboard while adding (or removing) peripherals may void the warranty.

If problems arise when installing the peripherals, contact the computer outlet where you purchased the peripheral or Micronics' Technical Support.

PCI LOCAL BUS CARD

PCI Local Bus slots accommodate most PCI-approved Local Bus cards. To install a PCI Local Bus card:

- Power OFF the computer system.
- Locate an unused PCI slot on the M54Pi.
- Insert the card with the bottom edge level. Never insert the card at an angle!
- Holding the card at the center of the top edge, gently push straight in. Do not force the card into place. If it does not fit, take it out and try again.
- Make sure the card is fully inserted.
- Secure the card with a bracket screw.

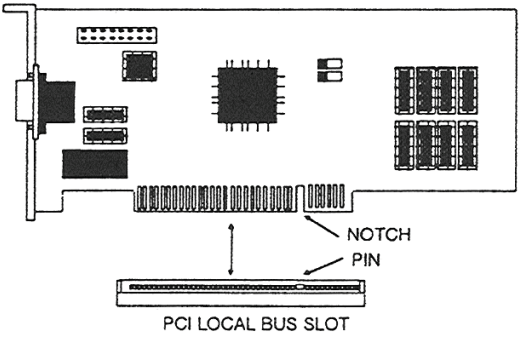


Figure 4-1. Installing a PCI Local Bus Card

Note: The ISA slot J11 and the PCI slot J2 are "shared slots." When a PCI card is installed into the J2 PCI slot, the J11 ISA slot is Disabled. Conversely, when a peripheral card is installed into the J11 ISA slot, the J2 PCI slot is disabled.

THE SIMMs

The M54Pi has six, 36-bit (72-pin) SIMM sockets on-board and can accommodate memory from 8MB up to 192MB using the following SIMM sizes:

- 4MB- organized as 1MB x 36
- 8MB- organized as 2MB x 36
- 16MB- organized as 4MB x 36
- 32MB- organized as 8MB x 36

The system board requires at least two SIMM sockets (one bank) to be filled. The SIMMs must be rated at 70ns or faster.

- Bank 0 (refer to figure 3-1 on page 3-2) must always be filled and contain two identically sized SIMMs.
- Bank 1, if filled, must contain the same size SIMMs.
- Bank 2, if filled, must contain the same size SIMMs.

INSTALLING THE SIMMs

- Hold the SIMM so that the NOTCHED edge points towards the bottom of the board.

- Insert the SIMM at an 45 degree angle.

- Gently push the SIMM to an upright position until it "snaps" into place (past the release tabs).

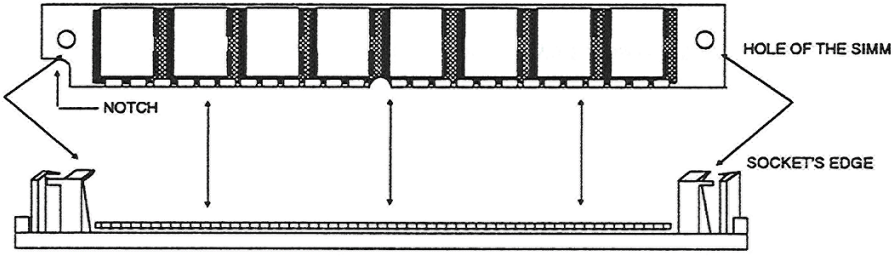
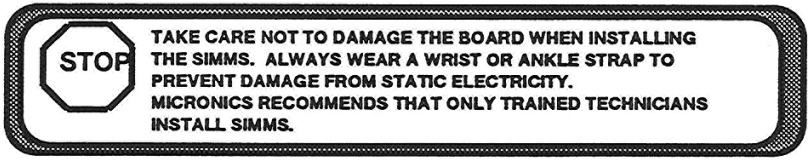


Figure 4-2. Installing a SIMM

REMOVING THE SIMMs

- With both thumbs (or fingers), press the release tabs away from the socket. The SIMM should now be free from the release tabs.

- Lift the module out at a 45 degree angle.


STOP
TAKE CARE NOT TO DAMAGE THE BOARD WHEN INSTALLING THE SIMMS. ALWAYS WEAR A WRIST OR ANKLE STRAP TO PREVENT DAMAGE FROM STATIC ELECTRICITY.
MICRONICS RECOMMENDS THAT ONLY TRAINED TECHNICIANS INSTALL SIMMS.

DRAM MEMORY

The following table lists all allowable memory configuration.

Table 4-1. DRAM Memory Configuration

Bank 0	Bank 0	Bank 1	Bank 1	Bank 2	Bank 2	Total
4MB	4MB					8MB
4MB	4MB	4MB	4MB			16MB
4MB	4MB	4MB	4MB	4MB	4MB	24MB
8MB	8MB					16MB
4MB	4MB	8MB	8MB			24MB
8MB	8MB	8MB	8MB			32MB
4MB	4MB	4MB	4MB	8MB	8MB	32MB
4MB	4MB	8MB	8MB	8MB	8MB	40MB
8MB	8MB	8MB	8MB	8MB	8MB	48MB
16MB	16MB					32MB
4MB	4MB	16MB	16MB			40MB
8MB	8MB	16MB	16MB			48MB
16MB	16MB	16MB	16MB			64MB
4MB	4MB	4MB	4MB	16MB	16MB	48MB
4MB	4MB	8MB	8MB	16MB	16MB	56MB
8MB	8MB	8MB	8MB	16MB	16MB	64MB
4MB	4MB	16MB	16MB	16MB	16MB	72MB
8MB	8MB	16MB	16MB	16MB	16MB	80MB
16MB	16MB	16MB	16MB	16MB	16MB	96MB
32MB	32MB					64MB
4MB	4MB	32MB	32MB			72MB
8MB	8MB	32MB	32MB			80MB
16MB	16MB	32MB	32MB			96MB
32MB	32MB	32MB	32MB			128MB

Table 4-1. DRAM Memory Configuration (Cont'd.)

Bank 0	Bank 0	Bank 1	Bank 1	Bank 2	Bank 2	Total
4MB	4MB	4MB	4MB	32MB	32MB	80MB
4MB	4MB	8MB	8MB	32MB	32MB	88MB
4MB	4MB	16MB	16MB	32MB	32MB	104MB
8MB	8MB	8MB	8MB	32MB	32MB	96MB
8MB	8MB	16MB	16MB	32MB	32MB	112MB
16MB	16MB	16MB	16MB	32MB	32MB	128MB
4MB	4MB	32MB	32MB	32MB	32MB	136MB
8MB	8MB	32MB	32MB	32MB	32MB	144MB
16MB	16MB	32MB	32MB	32MB	32MB	160MB
32MB	32MB	32MB	32MB	32MB	32MB	192MB

INSTALLING CACHE MEMORY

The M54Pi comes standard with 256K of secondary cache installed on-board. Another level of cache can be installed to provide 512K of secondary cache memory.

512K OF SECONDARY CACHE

To add an additional 256K bytes of secondary cache; install eight, 32K X 8-15ns or faster (Model: 3.3v/5v tolerant) SRAMs into sockets U9 through U16. After installing the cache, refer to table 3-4 (on page 3-4) for the correct jumper settings.

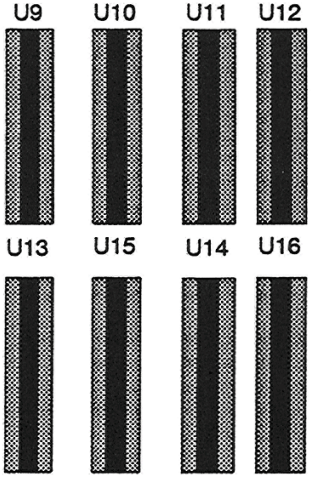


Figure 4-3. Installing 512K of Secondary Cache

Note: The SRAM modules installed must be a name brand or a high quality component. Lower quality modules may affect the performance of the M54Pi.

CHAPTER 5: INSTALLATION

The actual installation of the M54Pi system board depends on the type of case you have. Consult the computer system's user's manual when installing the M54Pi, or contact the Technical Support department of the dealer where you purchased the computer system.

Before installing the M54Pi system board, make sure that there is a clear work space available.

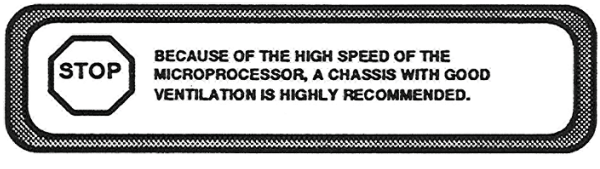
TOOLS REQUIRED

Micronics recommends the following tools to install the M54Pi system board.

- A small Philips screwdriver.
- Tweezers or a pair of needle-nose pliers.
- A tray to hold the loose screws.

EQUIPMENT REQUIRED

- A chassis with standard hardware.
- A standard power supply that is capable of providing continuous power within a 5 volt range, plus or minus 5% (e.g.: 4.75 to 5.25). A power filter may be added for areas with noisy transmission.
- Hard Disk drive and Floppy Disk drive (360K, 720K, 1.2M, 1.44M, or 2.88M).
- An eight ohm speaker.
- A Video card (monochrome, VGA or SVGA).
- Serial and parallel port cables.
- Flat ribbon cables between the Hard/Floppy drive controller.
- AT-compatible keyboard (84 or 101 keyboard).
- A standard video monitor.
- A heat-sink with a fan for higher performance processors (may be already installed).



CHAPTER 6: CONFIGURING THE M54Pi

After all the components have been installed and all the extras added, your system is ready to be configured. Before power-up, make sure all the cables are connected correctly.

You may want to keep the system open by not replacing the cover. This way, if there are any problems, you can address them without much difficulty.

INITIAL BOOT UP

Boot-up the M54Pi. If after power-up, the system doesn't properly boot, check all your connections and peripherals. You may also get beep codes or other messages. If this happens, consult Appendixes A and/or B of this manual for a guide to possible problems.

After the system boots properly, it is ready to be configured. The following pages discuss the proper procedures for BIOS configuration.

THE SETUP PROCEDURE

The SETUP procedure is already built into the system. SETUP will begin after the completed system is powered up.

Once the system is powered up and goes through a memory test, the following message will appear on your monitor:

```
PhoenixBIOS Version 4.02        M54Pi-Pxx
Copyright 1987-1993  Phoenix Technologies, Ltd.,  All Rights Reserved

CPU=Pentium xx MHz
xxxxxxxK System RAM Passed
xxxxxxxK Extended RAM Passed
xxxxK Cache SRAM Passed
System Bios Shadowed
Video Bios Shadowed

Press <F2> to enter SETUP
```

Figure 6-1. Power-Up Screen

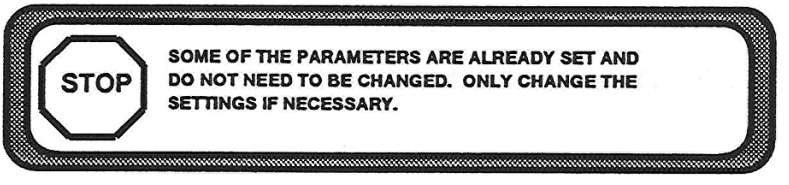
After the message appears, press <F2> to begin the **Setup** procedure. The Main Configuration Screen (see Figure 6-2) should now have appeared. The prompt should be on the time line.

RUNNING THE SETUP PROCEDURE

The M54Pi system board has eight configuration screens:

- Main Configuration Screen (Figure 6-2)
- Fixed Disk 0 and 1 Control (Figure 6-3)
- Fixed Disk 2 and 3 Control (Figure 6-4)
- Memory Cache Configuration (Figure 6-5)
- Memory Shadow (Figure 6-6)
- Boot Options (Figure 6-7)
- Advanced Options (Figure 6-8)
- Integrated Peripherals (Figure 6-9)
- Security Configuration (Figure 6-10)

Each screen configures specific parameters for the M54Pi system board. The following section is an overview of each screen and their functions.



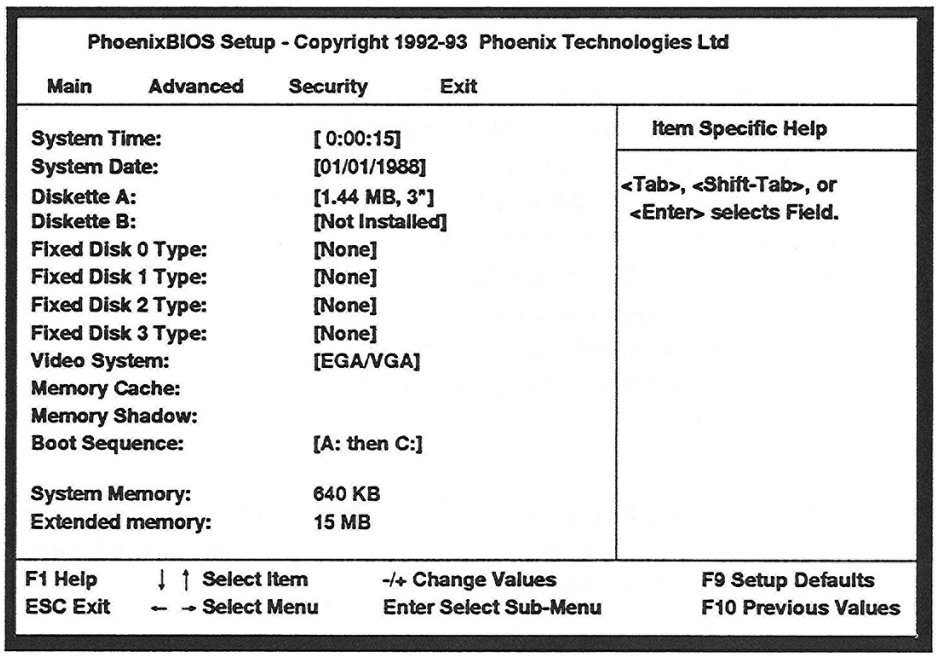


Figure 6-2. Main Configuration Screen

SYSTEM TIME AND DATE

To set the time, use the - key to decrease the number; use the + key to increase the number. To move the prompt forward, use the tab key (or enter); to move the prompt backward, use the shift-tab key.

Follow the same procedure for the date.

DISKETTE A OR B

This allows you to configure a diskette drive added or removed from your computer. Use the +/- keys to toggle between the options.

FIXED DISK 0 OR 1

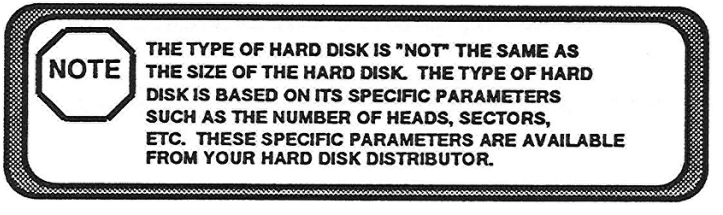
This parameter allows you to configure a hard disk connected to the on-board primary PCI IDE controller or connected to an off-board controller.

To install most SCSI hard drives, select NONE. To install an ESDI or RLL hard drive, select TYPE 1. To manually configure the hard drive, select USER. Press the directional arrow keys and type in the appropriate parameters. Drives that have the capability to be Auto-Configured will report its parameters to the BIOS.

FIXED DISK 2 OR 3

This parameter allows you to configure a hard disk connected to the on-board secondary ISA IDE controller. The settings are the same as the FIXED DISK 0 or 1.

See Appendix C for a complete listing of the available hard disk drives for all four selections.


NOTE
THE TYPE OF HARD DISK IS "NOT" THE SAME AS THE SIZE OF THE HARD DISK. THE TYPE OF HARD DISK IS BASED ON ITS SPECIFIC PARAMETERS SUCH AS THE NUMBER OF HEADS, SECTORS, ETC. THESE SPECIFIC PARAMETERS ARE AVAILABLE FROM YOUR HARD DISK DISTRIBUTOR.

VIDEO SYSTEM

This sets the type of monitor required for your computer. The Display peripheral will support EGA/VGA, CGA 80 x 25, or MONO (Monochrome).

MEMORY CACHE

This selection allows the user to go to the Memory Cache Configuration Screen (refer to Figure 6-5). Set the system board's memory cache in this sub-menu.

MEMORY SHADOW

This selection allows the user to go to the Memory Shadow Screen (refer to Figure 6-6). Shadow the system board's memory in this sub-menu.

BOOT SEQUENCE

This selection also offers a sub-menu so that the user can specifically set the system board's boot sequence. Press <ENTER> to go to this sub-menu (refer to Figure 6-7).

The selections for Boot Sequence in the Main Screen include A: THEN C:, C: THEN A, or C: ONLY.

SYSTEM MEMORY AND EXTENDED MEMORY

Both of these memory settings are automatically configured.

FIXED DISK 0 AND 1 CONTROL

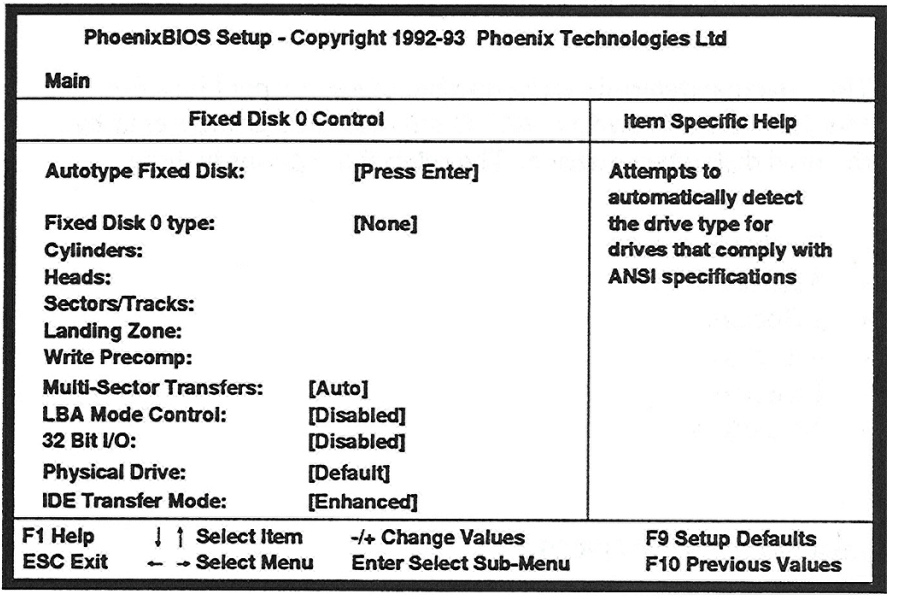

PhoenixBIOS Setup - Copyright 1992-93 Phoenix Technologies Ltd
Main
Fixed Disk 0 Control
Item Specific Help
Autotype Fixed Disk: [Press Enter]
Fixed Disk 0 type: [None]
Cylinders:
Heads:
Sectors/Tracks:
Landing Zone:
Write Precomp:
Multi-Sector Transfers: [Auto]
LBA Mode Control: [Disabled]
32 Bit I/O: [Disabled]
Physical Drive: [Default]
IDE Transfer Mode: [Enhanced]
Attempts to automatically detect the drive type for drives that comply with ANSI specifications
F1 Help ↓ ↑ Select Item -/+ Change Values F9 Setup Defaults
ESC Exit ← → Select Menu Enter Select Sub-Menu F10 Previous Values

Figure 6-3. Fixed Disk 0 and 1 Control Screen

AUTOTYPE FIXED DISK

This selection automatically identifies the type of IDE hard drives that comply with ANSI specifications. Press <ENTER> to continue.

FIXED DISK 0 or 1 TYPE

This selection allows the user to select the specific fixed drive installed in the system. The options include NONE, USER, and 1 THRU 39.

MULTI-SECTOR TRANSFERS

This selection determines the number of sectors per block for Multiple Sector Transfers. AUTO refers to the size answered by the hard disk when queried. The selectable options include:

- Disabled
- Auto (Default)
- 2 Sectors
- 4 Sectors
- 8 Sectors
- 16 Sectors

LBA MODE CONTROL

This option enables the LBA (Logical Block Addressing) disk for addressing. This selection should only be enabled IDE drives larger than 528MB in size that support LBA. Select either ENABLED or DISABLED (default).

IDE TRANSFER MODE

This option selects the transfer mode for the on-board Primary PCI IDE controller. The options are ENHANCED, MODE 2, MODE 1, and MODE 0 (default). Where:

- ENHANCED is equivalent to Mode 3 with a minimum cycle time of 180 ns (11.1 MB/sec).
- MODE 2- minimum cycle time of 240 ns (8.33 MB/sec).
- MODE 1- minimum cycle time of 383 ns (5.22 MB/sec).
- MODE 0- minimum cycle time of 600 ns (3.33 MB/sec).

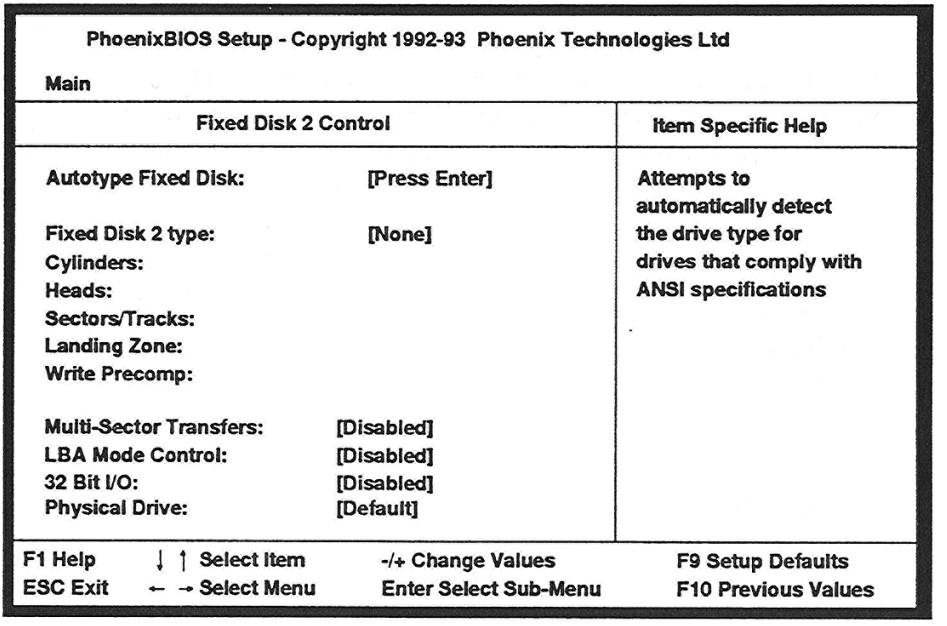


Figure 6-4. Fixed Disk 2 and 3 Control Screen

AUTOTYPE FIXED DISK

This selection automatically identifies the type of IDE hard drives that comply with ANSI specifications. Press <ENTER> to continue.

FIXED DISK 2 or 3 TYPE

This selection allows the user to select the specific fixed drive installed in the system. The options include NONE, USER, and 1 THRU 39.

MULTI-SECTOR TRANSFERS

This selection determines the number of sectors per block for Multiple Sector Transfers. AUTO refers to the size answered by the hard disk when queried. The selectable options include:

- Disabled
- Auto (Default)
- 2 Sectors
- 4 Sectors
- 8 Sectors
- 16 Sectors

LBA MODE CONTROL

This option enables the LBA (Logical Block Addressing) disk for addressing. This selection should only be enabled IDE drives larger than 528MB in size that support LBA. Select either ENABLED or DISABLED (default).

CACHE CONFIGURATION

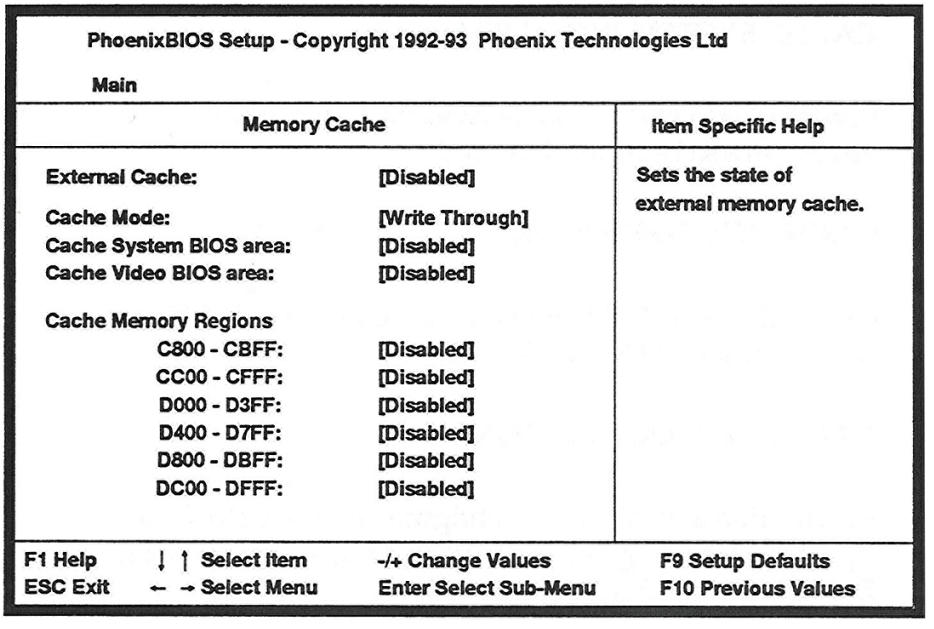

PhoenixBIOS Setup - Copyright 1992-93 Phoenix Technologies Ltd
Main
Memory Cache
Item Specific Help
External Cache: [Disabled]
Cache Mode: [Write Through]
Cache System BIOS area: [Disabled]
Cache Video BIOS area: [Disabled]
Cache Memory Regions
C800 - CBFF: [Disabled]
CC00 - CFFF: [Disabled]
D000 - D3FF: [Disabled]
D400 - D7FF: [Disabled]
D800 - DBFF: [Disabled]
DC00 - DFFF: [Disabled]
Sets the state of external memory cache.
F1 Help ↓ ↑ Select Item -/+ Change Values F9 Setup Defaults
ESC Exit ← → Select Menu Enter Select Sub-Menu F10 Previous Values

Figure 6-5. Cache Configuration Screen

EXTERNAL CACHE

This selection allows you to enable the external (secondary) cache. The selections are DISABLED or ENABLED (default). For optimum performance, select ENABLED.

CACHE MODE

This selection allows you to select the type of secondary cache installed on board. The M54Pi system can utilize the WRITE-THROUGH or WRITE-BACK (default) mode. When adding additional cache, make sure the jumpers are set correctly.

CACHE SYSTEM BIOS AREA

Choose ENABLED (default) to cache the system BIOS. This option can also be set to DISABLED.

CACHE VIDEO BIOS AREA

Choose ENABLED (default) to cache the video BIOS. This option can also be set to DISABLED.

CACHE MEMORY REGIONS

This section allows you to configure specified blocks of upper memory regions for caching. The selections include ENABLED or DISABLED (default).

MEMORY SHADOW

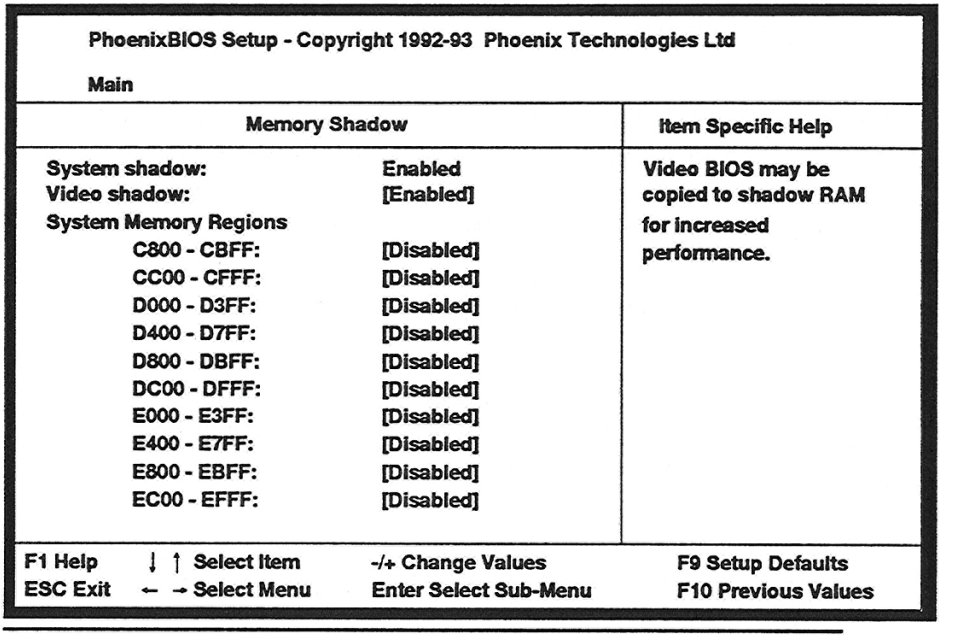

PhoenixBIOS Setup - Copyright 1992-93 Phoenix Technologies Ltd
Main
Memory Shadow
Item Specific Help
System shadow: Enabled
Video shadow: [Enabled]
System Memory Regions
C800 - CBFF: [Disabled]
CC00 - CFFF: [Disabled]
D000 - D3FF: [Disabled]
D400 - D7FF: [Disabled]
D800 - DBFF: [Disabled]
DC00 - DFFF: [Disabled]
E000 - E3FF: [Disabled]
E400 - E7FF: [Disabled]
E800 - EBFF: [Disabled]
EC00 - EFFF: [Disabled]
Video BIOS may be copied to shadow RAM for increased performance.
F1 Help ↓ ↑ Select Item -/+ Change Values F9 Setup Defaults
ESC Exit ← → Select Menu Enter Select Sub-Menu F10 Previous Values

Figure 6-6. Memory Shadow Screen

SYSTEM SHADOW

System shadow is automatically configured to ENABLED. This will copy the system BIOS into RAM for faster execution, which allows you to take advantage of the high-speed memory bus, the 70 nanosecond RAM or even the fast-cache SRAM.

VIDEO SHADOW

Choosing ENABLE (default) allows the system's video BIOS to be copied to shadow RAM for increased performance. Some video cards cannot be shadowed, in which case this selection must be set to DISABLED.

SHADOW MEMORY REGIONS

This section allows you to "Shadow" certain memory regions on the system board. Shadow memory can not be cached for any of the regions.

The selections for each shadow memory region (C800-CBFF through EC00-EFFF) are ENABLED and DISABLED (default).

BOOT OPTIONS

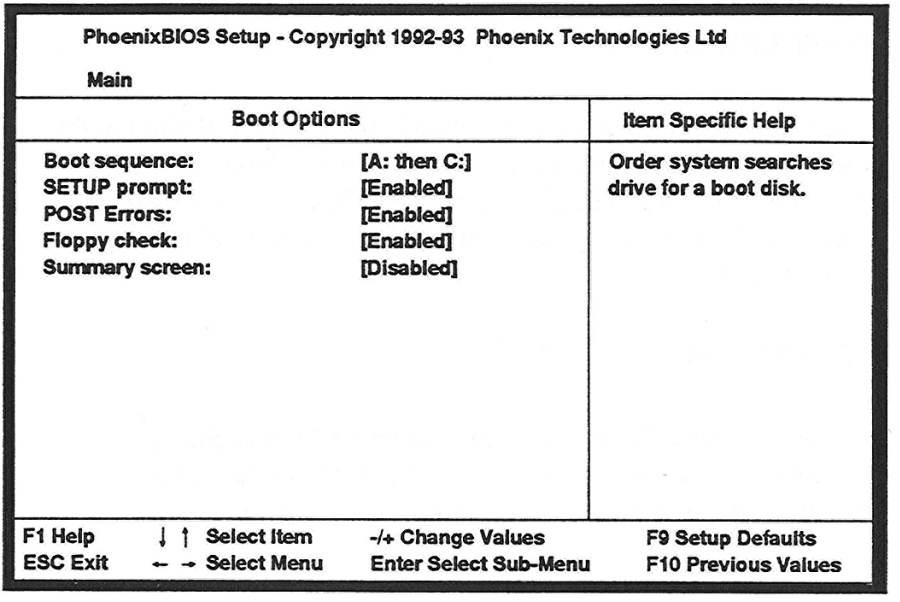


Figure 6-7. Boot Options Screen

The Boot Option screen can be entered through the Main Configuration screen.

BOOT SEQUENCE

The selections specifies the system board's boot sequence. The options include A: THEN C:, C: THEN A, or C: ONLY. The selection can also be set in the Main Configuration screen.

SETUP PROMPT

When selected to ENABLED (default), the system will display the following message upon boot-up: "Press <F2> to enter SETUP." Select DISABLED to deactivate the message. DISABLED does not prevent later entry into the Configuration screens.

BOOT OPTIONS

POST ERRORS

When selected to ENABLED (default), the system will display the following message upon an error on boot-up: "Press <F1> to continue or <F2> to SETUP." Select DISABLED to deactivate the message. If the message is deactivated, the system will always attempt to boot.

FLOPPY CHECK

When selected to ENABLED, the system will verify the floppy-type upon boot-up. Select DISABLED (default) to deactivate the message and speed up the boot process.

SUMMARY SCREEN

When selected to ENABLED (default), the system will display the system configuration during boot-up. Select DISABLED to deactivate the message and speed up the boot process.

ADVANCED OPTIONS

This selection allows the user to enter a sub-menu to configure options for the on-board I/O device. Press <ENTER> to activate the sub-menu.

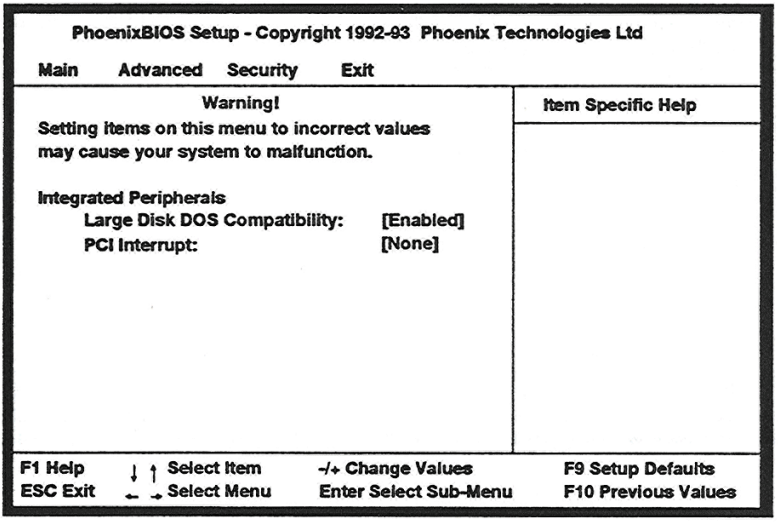

PhoenixBIOS Setup - Copyright 1992-93 Phoenix Technologies Ltd
Main Advanced Security Exit
Warning!
Setting items on this menu to incorrect values may cause your system to malfunction.
Item Specific Help
Integrated Peripherals
Large Disk DOS Compatibility: [Enabled]
PCI Interrupt: [None]
F1 Help ↓ ↑ Select Item -/+ Change Values F9 Setup Defaults
ESC Exit ← → Select Menu Enter Select Sub-Menu F10 Previous Values

Figure 6-8. Advanced Options Screen

LARGE DISK DOS COMPATIBILITY

When this selection is set to ENABLED, it will provide different geometries for various operating systems other than DOS. Set this to DISABLED (default) for the DOS operating system.

PCI INTERRUPT

This selection allows the user to select the IRQ shared by all of the PCI slots. The selections are NONE (default), IRQ10, IRQ11, IRQ12, and IRQ15.

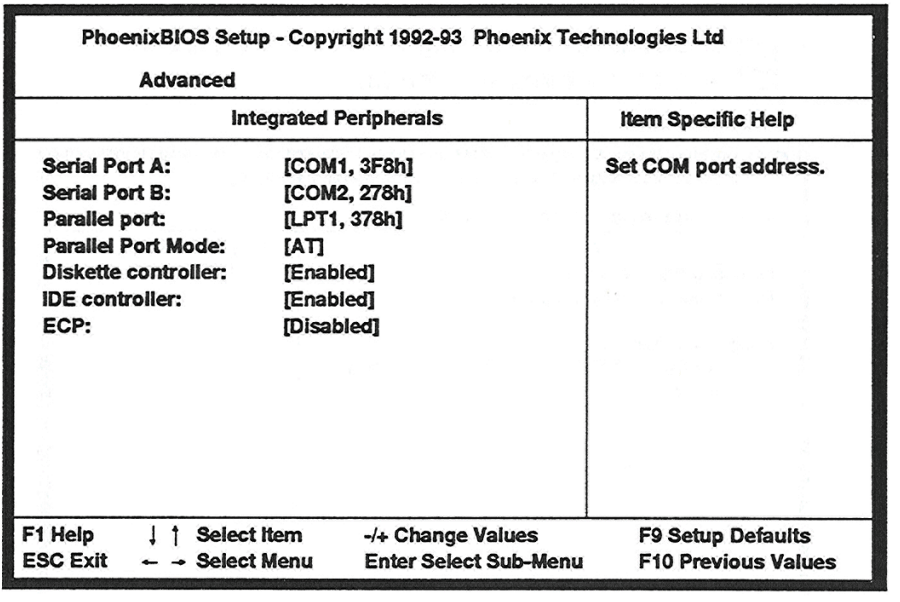

PhoenixBIOS Setup - Copyright 1992-93 Phoenix Technologies Ltd
Advanced
Integrated Peripherals
Item Specific Help
Serial Port A: [COM1, 3F8h]
Serial Port B: [COM2, 278h]
Parallel port: [LPT1, 378h]
Parallel Port Mode: [AT]
Diskette controller: [Enabled]
IDE controller: [Enabled]
ECP: [Disabled]
Set COM port address.
F1 Help ↓ ↑ Select Item -/+ Change Values F9 Setup Defaults
ESC Exit ← → Select Menu Enter Select Sub-Menu F10 Previous Values

Figure 6-9. Integrated Peripherals Screen

SERIAL PORT A

This selection allows the user to choose one of the two available COM ports for use as a serial device. The options are COM1, 3F8h (default); COM3, 3E8h, and DISABLED. IRQ 4 is used when set to COM1 or COM3.

SERIAL PORT B

This selection allows the user to choose one of the two available COM ports for use as a serial device. The options are COM2, 2F8h (default); COM4, 2E8h, and DISABLED. IRQ 3 is used when set to COM2 or COM4

PARALLEL PORT

This selection chooses the available parallel port. The options are LPT1, 378h, IRQ7 (default); LPT2, 278h, IRQ 5; and DISABLED.

PARALLEL PORT MODE

This selection sets the parallel port to output mode only or bi-directional mode. Select AT (default) for output mode or PS/2 for bi-directional mode.

DISKETTE CONTROLLER

This selection enables or disables the on-board floppy controller. The options are ENABLED (default) or DISABLED.

IDE CONTROLLER

This selection enables or disables the on-board SMC665 ISA IDE controller. The options are ENABLED (default) or DISABLED.

ECP

This selection enables or disables the Extended Capabilities Parallel Port. The options are ENABLED or DISABLED (default) .

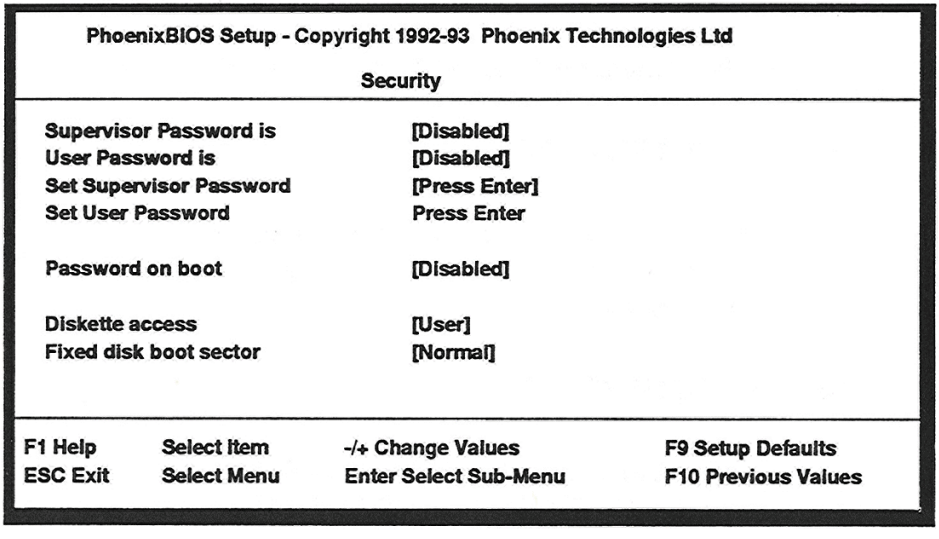


Figure 6-9. Security Configuration Screen

SUPERVISOR PASSWORD IS

This allows a supervisor to enter a password. The password will take effect only after the system is rebooted. Entering a blank password will disable it.

USER PASSWORD IS

This allows the user to enter a password. The password will take effect only after the system is rebooted. Entering a blank password will disable it.

SECURITY

SET SUPERVISOR PASSWORD

This selection activates the supervisors' password. Press the <ENTER> key to setup the password.

SET USER PASSWORD

This selection activates the users' password. Press the <ENTER> key to setup the password. This selection can only be activated by the supervisor when the supervisor password is available.

PASSWORD ON BOOT

This selection allows the user to enable or disable the password upon boot-up. The options are ENABLED or DISABLED (default).

DISKETTE ACCESS

This selection allows diskette access with an option of the supervisor or user. The options are SUPERVISOR or USER (default).

FIXED DISK BOOT SECTOR

This selection allows the boot sector of the fixed disk to be write-protected. The options are WRITE PROTECT or NORMAL (default).

APPENDIX A: POST AND BOOT ERROR MESSAGES

POST has two kinds of messages; those messages are the Error message and the Informational message. The following tables list these messages, their causes, and their solutions.

NUMBER/MESSAGE	POSSIBLE CAUSE	SOLUTION
NO DISKETTE CONTROLLER	If Floppy controller is not found.	Change the configuration.
DISKETTE DRIVE RESET FAILED	The diskette adapter has failed.	Check the diskette adapter.
DISKETTE DRIVE B FAILURE	The B drive failed or is missing.	Check the B drive.
DISKETTE DRIVE A FAILURE	The A drive failed or is missing.	Check the A drive.
DISKETTE READ FAILURE; STRIKE F1 TO RETRY BOOT	The diskette is not formatted or is defective.	Replace the diskette with a formatted diskette and retry.
DISPLAY ADAPTER FAILED; USING ALTERNATE	The color/monochrome switch is not set correctly, or the primary video adapter failed.	Change the switch to the correct setting, or check the primary video adapter.
ERRORS FOUND; DISK X FAILED INITIALIZATION	The POST reports hard disk configuration information is incorrect.	Rerun SETUP and enter the correct hard disk information.
ERRORS FOUND; INCORRECT CONFIGURATION INFORMATION; MEMORY SIZE MISCOMPARE	The POST reports the size of base, or the expansion memory, does not agree with configuration information.	Enter correct memory size and rerun SETUP procedure.
FIXED DISK CONFIGURATION FAILURE	The specified configuration is not supported.	Correct the hard disk configuration.
FIXED DISK CONTROLLER FAILURE	The controller card has failed.	Replace controller card.

NUMBER/MESSAGE	POSSIBLE CAUSE	SOLUTION
FIXED DISK X FAILURE (where X =0 or 1)	The hard disk crashed.	Press F1 to reboot or rerun Setup. If this does not work, replace hard disk.
HARD READ FAILURE- STRIKE F1 TO RETRY BOOT	The hard disk failed.	Press F1 to reboot or rerun Setup. If this does not work, replace hard disk.
FDD CONTROLLER FAILURE	Diskette controller failed.	Replace controller card.
FDD A IS NOT INSTALLED	Can not find diskette controller for drive A.	Install or replace controller card.
FDD B IS NOT INSTALLED	Can not find diskette controller for drive B.	Install or replace controller card.
KEYBOARD CLOCK LINE FAILURE. or KEYBOARD DATA LINE FAILURE	The Keyboard logic failed.	Make sure the kybrd cable is connected correctly
KEYBOARD STUCK KEY FAILURE	The Key(s) is jammed	Make sure the keyboard is not dirty.
REAL TIME CLOCK FAILURE	The Real-time clock logic failed.	Check battery or field service is required.
TIME-OF-DAY NOT SET- RUN SETUP PROGRAM	The Real-time clock time-of-day is not running.	Run SETUP utility
BIOS XXXX ROM BAD CHECKSUM (where XXXX=c8000 to E0000)	The optional ROM checksum is bad.	Replace Add-on card.
DISKETTE READ FAILURE, or NOT A BOOT DISKETTE, or NO BOOT DEVICE AVAILABLE	If Boot from floppy diskette failed.	Replace the diskette with a bootable diskette and retry
GATE A20 FAILURE	Protected mode can not be enabled.	Check or replace system board.

MESSAGE	POSSIBLE CAUSE	SOLUTION
DECREASING AVAILABLE MEMORY, or MEMORY FAILURE AT AAAAAAAA READ XXXX EXPECTING YYYY (where AAAAAAAA = failing address, XXXX=data read, and YYYY=data written)	The memory data integrity failed	Check contact points between memory modules and system board. Replace memory modules if necessary.
NVALID EISA CONFIGURATION STORAGE-PLEASE RUN THE CONFIGURATION UTILITY	The EISA configuration storage checksum is bad.	Run EISA configuration utility.
CONFIGURATION ERROR FOR SLOT NN- PLEASE RUN THE CONFIGURATION UTILITY	The EISA configuration mismatched EISA NVRAM.	Run EISA configuration utility and the EISA configuration file provided by the add-on card dealer
INVALID ISA CONFIGURATION	The ISA configuration is mismatched.	Run setup utility
MEMORY HAS BEEN ADDED OR REMOVED	The memory amount has changed	Run setup utility
NO TIMER TICK INTERRUPT or, TIMER 2 FAILURE	The timer tick (8254) failed to generate interrupt. Or Timer 2 (8254) failed.	Replace timer chip on system board. May require service call.
SHUTDOWN FAILURE	The shutdown logic failed.	Replace keyboard controller. May require service call.
KEYBOARD CONTROLLER FAILURE	The keyboard logic failed.	Replace keyboard controller. May require service call.
UNEXPECTED INTERRUPT IN PROTECTED MODE	An unexpected interrupt occurred in the protected mode while in memory test.	Check the logic associated with the non-maskable interrupt. May require service call.

APPENDIX B: BEEP CODES

Beep codes are a series of beeps through the speaker that indicate a problem during POST (Power On Self Test). If text appears on the video screen, the motherboard has completed POST; any other tone from the speaker indicates something other than a POST error. These tones **are not** described in the following table.

The beep error codes are all a series of three sets of beeps. The duration of the beep tones are constant, but the length of the pauses between the beeps varies. For example, a 1-3-3 beep codes will sound like one beep, a pause, three beeps consecutively, another pause, and then three more beeps again.

There is one beep code that is often misunderstood. With no video card installed, or if the video card is failing, the motherboard will generate a long-short-long-short beep code. This often is interpreted as a 1-2-1 beep code. But POST errors always vary in the length of the pause, and not the duration of the beep tone.

Another way of identifying a POST error is to use a device called a POST-card. This peripheral card is inserted into one of the ISA slots and has an LED (or LCD) read out showing the contents of port 80h.

The following table list all the beep codes and their probable causes.

BEEP CODES (Cont'd.)

BEEP CODE	CONTENTS PORT 80h	DESCRIPTION
None	01h	CPU register test in progress.
1-1-3	02h	CMOS read/write failure.
1-1-4	03h	ROM BIOS check failure.
1-2-1	04h	Programmable interval timer failure.
1-2-2	05h	DMA initialization failure.
1-2-3	06h	DMA page register write/read failure.
1-3-1	08h	RAM refresh verification failure.
None	09h	First 64K RAM test in progress.
1-3-3	0Ah	First 64K RAM chip or data line failure (multi-bit).
1-3-4	0Bh	First 64K RAM odd/even logic failure.
1-4-1	0Ch	Address line failure first 64K RAM.
1-4-2	0Dh	Parity failure first 64K RAM.
2-1-1	10h	Bit 0 first 64K RAM failure.
2-1-2	11h	Bit 1 first 64K RAM failure
2-1-3	12h	Bit 2 first 64K RAM failure.
2-1-4	13h	Bit 3 first 64K RAM failure.
2-2-1	14h	Bit 4 first 64K RAM failure.
2-2-2	15h	Bit 5 first 64K RAM failure.
2-2-3	16h	Bit 6 first 64K RAM failure.
2-2-4	17h	Bit 7 first 64K RAM failure.
2-3-1	18h	Bit 8 first 64K RAM failure.
2-3-2	19h	Bit 9 first 64K RAM failure.

BEEP CODES (Cont'd.)

BEEP CODE	CONTENTS PORT 80h	DESCRIPTION
2-3-3	1Ah	Bit 10 first 64K RAM failure.
2-2-4	1Bh	Bit 11 first 64K RAM failure.
2-3-1	1Ch	Bit 12 first 64K RAM failure.
2-4-2	1Dh	Bit 13 first 64K RAM failure.
2-4-3	1Eh	Bit 14 first 64K RAM failure.
2-4-4	1Fh	Bit 15 first 64K RAM failure.
3-1-1	20h	Slave DMA register failure.
3-1-2	21h	Master DMA register failure.
3-1-3	22h	Master interrupt mask register failure.
3-1-4	23h	Slave interrupt mask register failure.
None	25h	Interrupt vector loading in progress.
3-2-4	27h	Keyboard controller test failure.
None	28h	CMOS power failure and checks calculation in progress.
None	29h	CMOS configuration validation in progress.
3-3-4	2Bh	Screen initialization failure.
3-4-1	2Ch	Screen retrace test failure.
3-4-2	2Dh	Search for video ROM in progress.
None	2Eh	Screen running with video ROM.
None	30h	Screen operable.
None	30h	Screen running with video ROM.
None	31h	Monochrome monitor operable.
None	32h	Color monitor (40 column) operable.
None	33h	Color monitor (80 column) operable.

APPENDIX C: HARD DISK TYPES

Type	Cyl	Hd	Pre	Lz	Sec	Size (MB)
1	306	4	128	305	17	10
2	615	4	300	615	17	20
3	615	6	300	615	17	30
4	940	8	512	940	17	62
5	940	6	512	940	17	46
6	615	4	-1	615	17	20
7	462	8	256	511	17	30
8	733	5	-1	733	17	30
9	900	15	-1	901	17	112
10	820	3	-1	820	17	20
11	855	5	-1	855	17	35
12	855	7	-1	855	17	49
13	306	8	128	319	17	20
14	733	7	-1	733	17	42
15	Not Valid					
16	820	6	-1	820	17	40
17	977	5	300	977	17	40
18	977	7	-1	977	17	56
19	1024	7	512	1023	17	59
20	733	5	300	732	17	30
21	733	7	300	732	17	42
22	733	5	300	733	17	30
23	1024	5	-1	1023	17	42
24	925	9	-1	925	17	69
25	699	7	256	700	17	40
26	1024	4	-1	1023	17	34

HARD DISK TYPES (Cont'd.)

Type	Cyl	Hd	Pre	Lz	Sec	Size (MB)
27	1024	5	-1	1023	17	42
28	1024	8	-1	1023	17	68
29	512	8	256	512	17	34
30	615	2	615	615	17	10
31	989	5	0	989	17	41
32	1020	15	-1	1024	17	127
33	615	4	-1	615	26	31
34	820	6	-1	820	26	62
35	1024	9	1024	1024	17	76
36	1024	5	512	1024	17	42
37	1024	5	512	1024	26	65
38	823	10	256	824	17	68
39	615	4	128	664	17	20
40	615	8	128	664	17	40
41	917	15	-1	918	17	114
42	1023	15	-1	1024	17	127
43	823	10	512	823	17	68
44	User 1					
45	User 2					
46	User 3					
47	User 4					
48	Auto-config.					
49	Not Installed					

APPENDIX D: SPECIFICATIONS

Processor Options	Intel Pentium^{tm} Processor 735/90
Chipset	Intel 82430 PCI set (PCMC, LBX and SIO chips) SMC 665 Super I/O
CPU Options	P54CT CPU
Expansion Slots	Two 32-Bit 120-pin PCI One Shared PCI/ISA Four 16-bit ISA
RAM Capacity	Six 72-pin (x36 type) SIMM sockets, which accommodates up to 192MB of RAM
Cache	16K of internal cache memory
Cache Upgrade	256K of secondary cache memory on-board Optional 512K
IDE	Mode 3 IDE Two Resident 40-pin IDE connector (Primary and Secondary) Auto detection of add-in IDE board Multiple sector transfer support
Communication ports	Two on-board 16550-compatible serials ports One on-board bi-directional parallel port with EPP support

BIOS	Phoenix BIOS on 1MB Flash EPROM Boot-block for BIOS recovery Auto detection of memory size Auto configuration of IDE hard disk drive types
Burn-In	48 hours (minimum)

ENVIRONMENTAL SPECIFICATIONS

The environment that the M54Pi is located is critical. Micronics recommends the following environmental specifications:

TEMPERATURE RANGE

Operating: 50 degrees to 104 degrees Fahrenheit (10 degrees to 40 degrees Celsius)

Non-Operating: 50 degrees to 140 degrees Fahrenheit (10 degrees to 60 degrees Celsius)

Shipping: -22 degrees to 140 degrees Fahrenheit (-30 degrees to 60 degrees Celsius)

RELATIVE HUMIDITY (NON-CONDENSING)

Operating: 20% to 80%

Non-Operating: 5% to 90%

GLOSSARY

BIOS: Maintains and controls the entire functions of the computer. BIOS stands for Basic Input Output System.

Cache: Fast memory used to enhance the efficiency and speed of the computer.

CPU: Central Processing Unit. Essentially the brains of the computer.

Disk Controller: A computer card located in the system that controls either the Hard disk and/or the Floppy diskette drives.

Disk Drive: Either a Hard disk or a Floppy diskette.

DRAM: Dynamic Random Access Memory.

EISA: Extended Industry Standard Architecture.

ISA: Industry Standard Architecture.

POST: Power On Self Test. The computer's self-diagnostic test, which is executed whenever the system is booted.

Power Supply: A term used to describe electric energy, in or out, that powers the computer.

SIMM: Single In-line Memory Module. SIMMs are banks of memory used to increase performnace of the system.

SRAM: Static Random Access Memory.

VESA: Video Electronics Standards Association.

LIMITED WARRANTY

Except as described below, Micronics warrants the products to be free from defects in material and workmanship in normal use for a period of one (1) year after date of purchase. Should any product fail to perform according to this warranty at any time during the warranty period, except as provided below, Micronics or its authorized service centers will, at Micronics' option, repair or replace the product at no additional charge.

The warranty does not cover loss or damage which occurs in shipment or which is due to: (1) improper installation or maintenance, misuse, neglect or any cause other than ordinary commercial application, including without limitation, accidents or acts of God; (2) adjustment, repair or modification by other than a Micronics authorized service center; (3) improper environment, excessive or inadequate heating or air conditioning or electrical power failures, surges or other irregularities; (4) any statement about the product other than those set forth in this warranty; or (5) nonconformity to models or samples shown to the purchaser. Any models or samples were for the sole purpose of suggesting the character of the product and are not intended to form the basis of the bargain.

A receipt or copy of the invoice with the date of purchase from a Micronics reseller is required before any warranty service can be rendered. Service can be obtained by calling Micronics for a Return Merchandise Authorization (RMA) Number.

The RMA Number should be prominently displayed on the outside of the shipping carton of the returned product. Returned product should be shipped prepaid or hand carried to Micronics. The purchaser assumes risk of loss or damage in transit and, unless otherwise agreed to in writing by Micronics, will pay inbound shipping charges.

LIMITED WARRANTY (Cont'd.)

The exclusive remedy of the purchaser under this warranty above will be repair or replacement at Micronics option, but if for any reason that remedy should fail of its essential purpose, the exclusive remedy of the purchaser shall then be actual damages up to amounts paid for the defective product by the purchaser. This limited warranty shall be deemed to "fail of its essential purpose" if, after repeated efforts, Micronics is unable to make the product operate as warranted. Micronics' liability for damages to the purchaser for any cause whatsoever, regardless of the form of action and whether in contract or in tort, shall be limited to the purchase price in effect when the cause of action arose for the product that is the basis of the claim.

Micronics will not be liable for any lost profits or any indirect, special incidental or consequential damages in connection with the product, even if micronics has been advised of the possibility of such damages.

Micronics makes no warranties or representations as to performance of products or as to service to distributor or to any person, except as set forth in micronics' limited warranty accompanying delivery of product.

Micronics disclaims all other warranties whether oral, written, expressed or implied, including without limitation, the warranties of design, merchantability or fitness for a particular purpose, if applicable, or arising from a course of dealing, usage or trade practice.

NON-WARRANTY SERVICE

After the one year warranty service is no longer in effect, service is still available for Micronics products. For more information, contact Micronics' RMA department at
(510) 651-2300. The RMA department is open between
8:30 A.M. and 5 P.M. Pacific Standard time.

USER'S COMMENT FORM: M54Pi (P/N: 208-01, Rev. A)

What do you like about the manual?

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What would you change in this manual?

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PART NUMBER: 06-00208-01, VER. A JUNE 1994
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